

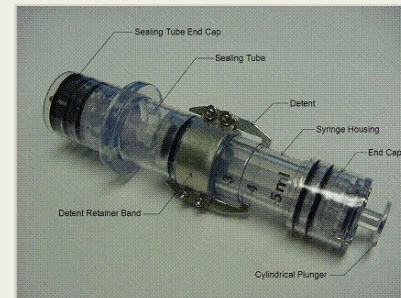
Life Science Research Sample Transfer Technology for On Orbit Analysis, Phase II

Completed Technology Project (2012 - 2015)



Project Introduction

With retirement of the space shuttle program, microgravity researchers can no longer count on bringing experiment samples back to earth for post-flight analysis. Locker-sized processing facilities, which were typically transported up to and down from the International Space Station during the shuttle era, quite simply consume too much volume, mass, and power to be accommodated as part of both the upmass and downmass on current space transportation vehicles. As a result, more analysis must be accomplished on ISS, which makes on-orbit analytical tools critical to the continued success of microgravity research. The Analytical Cassette transfer Tool (ACT) is a low-cost, disposable device that efficiently transfers experiment samples in a safe and contained manner from unique experiment specific spaceflight hardware to on-orbit analytical tools that enable real-time analysis in microgravity. ACT interfaces with several flight qualified processing payloads to extract experiment samples via a needle-less septum and then allows transfer of those samples into a number of different on-orbit analytical devices, including such instrumentation as the Light Microscopy Module, the Microfluidic Flow Cytometer, a Spectrophotometer, and/or a Mass Spectrometer. Applications in life and environmental sciences include sampling liquid cultures/suspensions or sampling spacecraft water for quality evaluation. ACT functions within or outside of on-orbit gloveboxes to safely transfer any liquid material from one container fitted with the ACT mating receptacle to another container fitted with a receptacle. Its safe, simple, effective, and with its economical advantage, ACT is destined to become the new standard fluid transfer device for the ISS and future space research venues. For the Phase II project, Techshot will develop a flight version of the ACT and subject it to the major spaceflight integration tests.



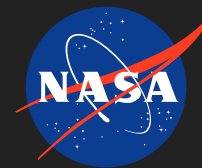
Life Science Research Sample Transfer Technology for On Orbit Analysis Project Image

Table of Contents

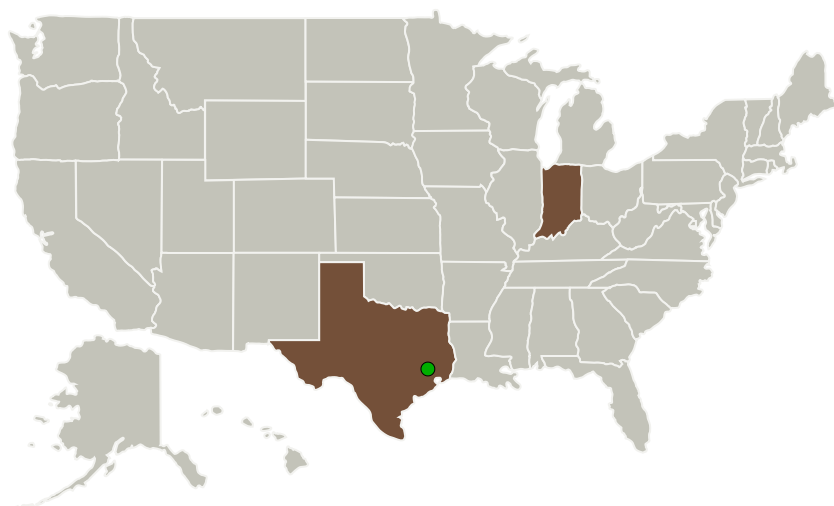
| | |
|--|---|
| Project Introduction | 1 |
| Primary U.S. Work Locations and Key Partners | 2 |
| Project Transitions | 2 |
| Organizational Responsibility | 2 |
| Project Management | 2 |
| Images | 3 |
| Technology Maturity (TRL) | 3 |
| Technology Areas | 3 |
| Target Destinations | 3 |

Life Science Research Sample Transfer Technology for On Orbit Analysis, Phase II

Completed Technology Project (2012 - 2015)



Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|-------------------------------|-------------------------|-------------|---------------------|
| Techshot, Inc. | Lead Organization | Industry | Greenville, Indiana |
| ● Johnson Space Center(JSC) | Supporting Organization | NASA Center | Houston, Texas |

| Primary U.S. Work Locations | |
|-----------------------------|-------|
| Indiana | Texas |

Project Transitions

▶ **April 2012:** Project Start

✓ **February 2015:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137401>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Techshot, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Michael Kurk

Co-Investigator:

Michael Kurk

Life Science Research Sample Transfer Technology for On Orbit Analysis, Phase II

Completed Technology Project (2012 - 2015)



Images

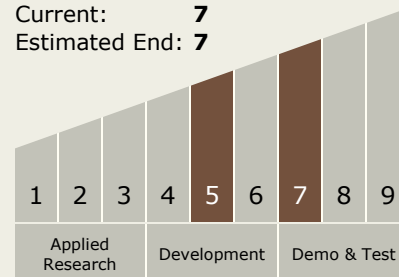


Project Image

Life Science Research Sample Transfer Technology for On Orbit Analysis Project Image
(<https://techport.nasa.gov/image/130312>)

Technology Maturity (TRL)

Start: 5
Current: 7
Estimated End: 7



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - TX06.3 Human Health and Performance
 - TX06.3.1 Medical Diagnosis and Prognosis

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System